

**PATENT COOPERATION TREATY**



From the  
INTERNATIONAL SEARCHING AUTHORITY

To:  
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**PCT**

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

(PCT Rule 43bis.1)

Applicant's or agent's file reference  131*355		Date of mailing (day/month/year)  08 MAR 2006
FOR FURTHER ACTION See paragraph 2 below		
International application No.  PCT/US05/01427	International filing date (day/month/year)  14 January 2005 (14.01.2005)	Priority date (day/month/year)  15 January 2004 (15.01.2004)
International Patent Classification (IPC) or both national classification and IPC  IPC(7): G02B 6/30 and US Cl.: 385/49		
Applicant  UNIVERSITY OF DELAWARE		

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Date of completion of this opinion  14 December 2005 (14.12.2005)	Authorized officer Brian M. Healy Telephone No. (703)308-1782
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Form PCT/ISA/237 (cover sheet) (April 2005)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US05/01427

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

the international application in the language in which it was filed  
 a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material  
 a sequence listing  
 table(s) related to the sequence listing

b. format of material  
 on paper  
 in electronic form

c. time of filing/furnishing  
 contained in the international application as filed.  
 filed together with the international application in electronic form.  
 furnished subsequently to this Authority for the purposes of search.

3.  In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE  
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International application No.  
PCT/US05/01427

**Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims <u>1-10</u>	YES
	Claims <u>NONE</u>	NO
Inventive step (IS)	Claims <u>1-10</u>	YES
	Claims <u>NONE</u>	NO
Industrial applicability (IA)	Claims <u>1-10</u>	YES
	Claims <u>NONE</u>	NO

**2. Citations and explanations:**

Claims 1-10 meets the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the claimed optical coupler for coupling light from an optical fiber to a silicon-on-insulator waveguide comprising: first and second top planar portions, a tapered top portion connecting the first and second top planar portions and a base portion connecting to the first and second top planar portions with side portions, the intersections of the base portion and one side portion forming a termination point wherein the tapered portion has a slope angle such that the light from the optical fiber reflects from the tapered portion and is incident upon the termination point equals a mode angle of the silicon-on-insulator waveguide. These limitations are recited in claim 1. Typical of the prior art references is Deliwala, U.S.P. No. 6,611,636 which teaches (Fig.55) an optical coupler device that couples a light beam 5120 that couples into a tapered coupler 5110,5106 to a silicon-on-insulator structure 102,103,104,106, however, the limitations of claims 1 teach claimed structural limitations which are not to be found in the Deliwala 636' reference. Independent claim 6 include limitations similar to that of claim 1. Dependent claims 2-5 and 7-10 include the limitations of independent claims 1 and 6 along with other additional limitations (See the dependent claims for these specific limitations).

Claims 1-10 has industrial applicability as an optical coupler device.